

CLAIMS

[1] A printing apparatus which receives a print instruction, then obtains print data including plural pieces of sub-data, and prints the print data, said printing apparatus comprising:

a print data obtainment unit operable to obtain the sub-data;

a determination unit operable to determine whether or not there is necessity of further obtaining of the obtained sub-data, by said data obtainment unit, in order to complete printing of the print data; and

a notification unit operable to notify a result of the determination, to a print instruction apparatus which issues the print instruction, when the determination is made that there is no necessity.

[2] The printing apparatus according to Claim 1, wherein the print data includes one parent sub-data and one or more child sub-data which are referred to by the parent sub-data, said print data obtainment unit is operable to obtain the parent sub-data prior to child sub-data, and

said determination unit is operable to determine the necessity regarding the child sub-data referred to by the obtained parent sub-data.

[3] The printing apparatus according to Claim 2, wherein said determination unit is operable to determine that there is no necessity, when the child sub-data obtained by said print data obtainment unit is referred to by only one part in the parent sub-data.

[4] The printing apparatus according to Claim 2, wherein said determination unit is operable to determine that

there is no necessity, when the child sub-data obtained by said print data obtainment unit is not further referred to by the parent sub-data.

5 [5] The printing apparatus according to Claim 2,
wherein the child sub-data referred to by the parent sub-data includes grand-child sub-data referred to by the child sub-data.

10 [6] The printing apparatus according to Claim 2,
wherein said determination unit is operable to determine the necessity only regarding the parent sub-data.

[7] The printing apparatus according to Claim 1,
wherein said notification unit is operable to notify a result of
15 the determination, only when a request for the notification is received from the print instruction apparatus.

[8] The printing apparatus according to Claim 7,
wherein said notification unit is operable to determine
20 whether or not the print instruction includes the request for the notification, and to notify a result of the determination regarding the necessity, only when the request is included.

[9] The printing apparatus according to Claim 2,
25 wherein the parent sub-data is described in a markup language, and the child sub-data is data except the data described in the markup language.

[10] The printing apparatus according to Claim 9,
30 wherein the parent sub-data is described in a hyper text markup language (HTML), and the child sub-data is one of image data and style information data.

[11] A printing method of receiving a print instruction, then obtaining print data including plural pieces of sub-data, and printing the print data, said printing method comprising:

- 5 a print data obtaining step of obtaining the sub-data;
- a determining step of determining whether or not there is necessity of further obtaining of the obtained sub-data, at said data obtaining step, in order to complete printing of the print data; and
- a notifying step of notifying a result of the determination, to
- 10 a print instruction apparatus which issues the print instruction, when the determination is made that there is no necessity.

[12] A program used in a printing apparatus, the printing apparatus receiving a print instruction, then obtaining print data

15 including plural pieces of sub-data, and printing the print data,

 said program causing a computer to execute the steps included in the printing method according to Claim 11.

[13] A print instruction apparatus which instructs a printing

20 apparatus to print print data including plural pieces of sub-data, said print instruction apparatus comprising:

- a print buffer in which at least one of the sub-data is held;
- a print data output unit operable to output the sub-data held in said print buffer, to the printing apparatus;
- 25 a necessity receiving unit operable to receive, from the printing apparatus, a notification that there is no necessity of further obtaining of the outputted sub-data, by the printing apparatus, in order to complete printing of the print data; and
- a deletion unit operable to delete the sub-data corresponding
- 30 to the notification, from said print buffer, when the notification is received.

[14] The print instruction apparatus according to Claim 13,
wherein the print data includes one parent sub-data and one
or more child sub-data which are referred to by the parent sub-data,
said print buffer in which only the parent sub-data is held
5 among the sub-data included in the print data, and
said deletion unit is operable to delete the parent data from
said print buffer.

[15] A memory release control method of releasing a print buffer in
10 a print instruction apparatus, the print instruction apparatus
instructing a printing apparatus to print print data including plural
pieces of sub-data, said memory release control method
comprising:

a step of holding at least one of the sub-data in the print
15 buffer;

a print data outputting step of outputting the sub-data held in
the print buffer, to the printing apparatus;

a necessity receiving step of receiving, from the printing
apparatus, a notification that there is no necessity of further
20 obtaining of the outputted sub-data, by the printing apparatus, in
order to complete printing of the print data; and

a deleting step of deleting the sub-data corresponding to the
notification, from the print buffer, when the notification is received.

25 [16] A program used in a print instruction apparatus, the print
instruction apparatus instructing a printing apparatus to print print
data including plural pieces of sub-data,

said program causing a computer to execute the steps
included in the memory release control method according to Claim

30 15.

[17] A printing system which includes a printing apparatus and a

print instructing apparatus, the print instruction apparatus instructing the printing apparatus to print print data including plural pieces of sub-data,

wherein said printing apparatus includes:

5 a print data obtainment unit operable to obtain the sub-data;
 a determination unit operable to determine whether or not there is necessity of further obtaining of the obtained sub-data, by said data obtainment unit in order to complete printing of the print data; and

10 a notification unit operable to notify a result of the determination to the print instruction apparatus, when the determination is made that there is no necessity, and

 said print instruction apparatus includes:

 a print buffer in which at least one of the sub-data is held;

15 a print data output unit operable to output the sub-data held in said print buffer, to the printing apparatus;

 a necessity receiving unit operable to receive the notification from the printing apparatus; and

 a deletion unit operable to delete the sub-data corresponding
20 to the notification, from the print buffer, when the notification is received.

[18] A printing method used in a system which includes a printing apparatus and a print instructing apparatus, the print instruction
25 apparatus instructing the printing apparatus to print print data including plural pieces of sub-data, said printing method comprising:

 a transferring step of transferring the sub-data held in a print buffer of the print instruction apparatus, to the printing apparatus;

30 a determining step of determining whether or not there is necessity of further transferring the transferred sub-data from the print instruction apparatus to the printing apparatus, in order to

complete printing of the print data in the printing apparatus;

a notifying step of notifying a result of the determination from the printing apparatus to the print instruction apparatus, when the determination is made that there is no necessity; and

- 5 a deleting step of deleting the sub-data held in the print buffer of the print instruction apparatus, when the notification is performed.